

WHAT IS CLAIMED IS:

1                   1.       A method for displaying timing data generated by simulating a circuit  
2 design, the method comprising:

3                   receiving the timing data from an EDA tool;  
4                   selecting relevant signals based on input received from a user;  
5                   generating waveforms for the relevant signals using the timing data;  
6                   displaying a portion of each of the waveforms in an interactive graphical user  
7 interface, wherein the portion of each waveform displayed in the interface includes time  
8 points of interest to the user;

9                   displaying pointers to the time points of interest on the waveforms;  
10                  receiving edits to the time points of interest in response to a user moving the  
11 pointers on the interactive graphical user interface; and

12                  updating timing parameters based on the edits to the time points of interest.

1                   2.       The method of claim 1 further comprising:  
2                   transmitting the updated timing parameters back to the EDA tool;  
3                   generating updated waveforms for the relevant signals using updated timing  
4 data received from the EDA tool, wherein the updated timing data is generated by simulating  
5 the circuit design using the updated timing parameters; and  
6                   displaying the updated waveforms in the interactive graphical user interface.

1                   3.       The method of claim 1 wherein:  
2                   displaying the portion of each of the waveforms in the interactive graphical  
3 user interface further comprises displaying a first waveform of a first clock signal received at  
4 a first storage element, and a second waveform of a second clock signal received at a second  
5 storage element.

1                   4.       The method of claim 3 wherein:  
2                   displaying the portion of each of the waveforms in the interactive graphical  
3 user interface further comprises displaying a third waveform of the first clock signal at first  
4 clock source, and a fourth waveform of the second clock signal at a second clock source,  
5                   the first waveform being delayed with respect to the third waveform by a first  
6 clock skew value, and the second waveform being delayed with respect to the fourth  
7 waveform by a second clock skew value.

1                   5.       The method of claim 3 wherein:  
2                   displaying the portion of each of the waveforms in the interactive graphical  
3 user interface comprises displaying a launch edge of the first clock signal at which the first  
4 storage element releases a data signal, and displaying a latch edge of the second clock signal  
5 at which the second storage element captures the data signal.

1                   6.       The method of claim 5 wherein:  
2                   the interactive graphical user interface displays portions of the first waveform  
3 and second waveforms that each start with a point in time corresponding to a period before  
4 both the launch and latch edges and end with a point in time corresponding to a period  
5 following both of those edges.

1                   7.       The method of claim 5 wherein:  
2                   the launch edge is a first time point of interest identified by a first one of the  
3 pointers on the interactive graphical user interface; and  
4                   the latch edge corresponds to a second time point of interest identified by a  
5 second one of the pointers on the graphical user interface.

1                   8.       The method of claim 5 wherein:  
2                   updating the timing parameters based on the edits to the time points of interest  
3 further comprises updating a multi-cycle value that represents a number of active edges in the  
4 second clock signal between the launch edge and the latch edge.

1                   9.       The method of claim 5 wherein:  
2                   updating the timing parameters based on the edits to the time points of interest  
3 further comprises inverting the launch edge of the first clock signal, either in a design file or  
4 as an input to a static timing verification tool.

1                   10.      The method of claim 5 wherein:  
2                   updating the timing parameters based on the edits to the time points of interest  
3 further comprises inverting the latch edge of the second clock signal.

1                   11.      A computer program product implemented on a computer system for  
2 providing timing data generated by simulating a circuit design using an EDA tool, the  
3 computer program product comprising:

4 code for generating waveforms for signals using the timing data;  
5 code for displaying a portion of each of the waveforms in an interactive  
6 graphical user interface, wherein the portion of each waveform displayed in the interactive  
7 graphical user interface includes time points of interest to the user;  
8 code for displaying pointers to the time points of interest on the waveforms;  
9 code for generating new timing parameters based on edits to the time points of  
10 interest received from the user, wherein the user moves the pointers on the interactive  
11 graphical user interface to generate the edits;  
12 code for generating updated waveforms for the signals using updated timing  
13 data, wherein the EDA tool generates the updated timing data by compiling, simulating and  
14 performing verification analysis on the circuit design using the new timing parameters;  
15 code for displaying the updated waveforms in the interactive graphical user  
16 interface; and  
17 a computer readable medium for reading the codes.

1 12. The computer program product according to claim 11 wherein:  
2 the code for displaying the portion of each of the waveforms in the interactive  
3 graphical user interface further comprises code for displaying each of the portions of the  
4 waveforms in synchronism.

1 13. The computer program product according to claim 11 wherein:  
2 the timing data generated by the EDA tool includes periods of a plurality of  
3 clock signals, duty cycles of the clock signals, offsets between the clock signals, and clock  
4 skews between sources of the clock signals and circuit elements that receive the clock  
5 signals.

1 14. The computer program product according to claim 11 wherein:  
2 the code for displaying the portion of each of the waveforms in the interactive  
3 graphical user interface further comprises code for displaying a first waveform of a first clock  
4 signal received at a first circuit, and code for displaying a second waveform of a second clock  
5 signal received at a second circuit.

1 15. The computer program product according to claim 14 wherein:  
2 the code for displaying the portion of each of the waveforms in the interactive  
3 graphical user interface further comprises code for displaying a third waveform of the first

clock signal at a first clock source, and a fourth waveform of the second clock signal at a second clock source,

wherein the first waveform is delayed with respect to the third waveform by a first clock skew value, and the second waveform is delayed with respect to the fourth waveform by a second clock skew value.

16. The computer program product according to claim 15 wherein the code for displaying the pointers to the time points of interest on the waveforms further comprises: code for displaying a first pointer to a launch edge of the first waveform that triggers a first latch to capture a data signal; and code for displaying a second pointer to a latch edge of the second waveform that triggers a second latch to capture the data signal.

17. The computer program product according to claim 16 wherein the code for displaying the pointers to the time points of interest on the waveforms further comprises: code for displaying a third pointer to an edge of the third waveform that corresponds to the launch edge of the first waveform; and code for displaying a fourth pointer to an edge of the fourth waveform that corresponds to the latch edge of the second waveform.

18. The computer program product according to claim 16 wherein: the code for generating the new timing parameters based on the edits to the time points of interest further comprises code for changing a multi-cycle value that represents a number of active edges in the second clock signal from the launch edge to the latch edge in response to the user moving the first or the second pointer on the interactive graphical user interface.

19. The computer program product according to claim 17 wherein: the code for generating the new timing parameters based on the edits to the time points of interest further comprises code for changing a multi-cycle value that represents a number of active edges in the second clock signal from the launch edge to the latch edge in response to the user moving the third or the fourth pointer on the interactive graphical user interface.

20. The computer program product according to claim 11 wherein the circuit design is a design for a field programmable gate array.